AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions and listings of claims in this application. Added matter is indicated by <u>underlining</u> and deleted matter is indicated by strikethroughs or double brackets ([[]]).

1-215. (Canceled)

216. (Currently Amended) A diffractive multifocal intraocular lens comprising:

a first surface and a second surface, said second surface opposes said first surface, said first surface having a first shape and said second surface having a second shape;

where said first surface includes diffractive pattern imposed on said first shape;

wherein said intraocular lens provides a base focus and an additional focus<u>, the intraocular lens having a negative spherical aberration</u>; and

wherein at least one of said first shape and said second shape has an aspheric component configured to reduce, for at least one of said base focus and said additional focus, a positive spherical aberration of a wavefront passing through said lens.

217. (Cancelled)

218. (Canceled)

219. (Currently Amended) The intraocular lens of <u>claim 216</u> [[claim 218]]wherein said intraocular lens is structured so that, when said wavefront is represented as a series of Zernike polynomials, a Zernike Z11 term describing said wavefront is reduced when said wavefront passes through said intraocular lens.

220. (Previously Presented) The intraocular lens of claim 219 wherein said series of Zernike polynomials comprises a fourth order term.

221. (Previously Presented) The intraocular lens of claim 216 wherein said intraocular lens comprises at least one of a silicone, a hydrogel, and an acrylate.

222. (Previously Presented) The intraocular lens of claim 216 wherein said second surface has said aspheric component.

223. (Previously Presented) The intraocular lens of claim 216 wherein an add power for said additional focus is between 2 and 6 diopters.

224. (Previously Presented) The intraocular lens of claim 216 wherein an add power for said additional focus is 3 to 4 diopters.

225. (Previously Presented) The intraocular lens of claim 216 wherein a light distribution between said base focus and said additional focus is between 70%:30% to 30%:70%.

226. (Previously Presented) The intraocular lens of claim 216 wherein a light distribution between said base focus and said additional focus is 50%:50%.

227. (Previously Presented) The intraocular lens of claim 216 wherein one of said first shape and said second shape is spherical.

228. (Previously Presented) The intraocular lens of claim 216 wherein said intraocular lens is designed to reduce wavefront aberrations of light passing into the eye when said intraocular lens has replaced a natural lens of an eye.

229. (Previously Presented) The intraocular lens of claim 216 having a base power of 18 diopters.

230. (Previously Presented) The intraocular lens of claim 216 having a diameter of 6 millimeters.

231. (Previously Presented) The intraocular lens of claim 216 having a thickness of 1.1 millimeters.

232. (Previously Presented) The intraocular lens of claim 216 wherein said first surface and said second surface each have radii of curvature between 12 and 13 millimeters.

233. (Previously Presented) The intraocular lens of claim 216 wherein said intraocular lens is designed to replace a natural lens of an eye.

234. (Canceled)

235. (Canceled)

236. (Previously Presented) The intraocular lens of claim 216 wherein said lens defines an optical axis, and at least one of said first shape and said second shape has a curvature at a periphery thereof that is less than a curvature at said optical axis.

237. (Cancelled)

238. (Previously Presented) The intraocular lens of claim 216 wherein said at least one of said first shape and said second shape is characterized by a mathematical model that includes at least one of (1) terms of a conoid of rotation and (2) terms of a conoid of rotation and at least one polynomial term.

239. (Previously Presented) The intraocular lens of claim 238 wherein said terms of said conoid of rotation include a conic constant that is less than zero.

240. (Previously Presented) The intraocular lens of claim 238 wherein said terms of said conoid of rotation include a conic constant that is less than minus one.

241. (Previously Presented) The intraocular lens of claim 216 wherein said at least one of said first shape and said second shape is a modified conoid surface.

242. (Previously Presented) The intraocular lens of claim 216 wherein said at least one of said first shape and said second shape is characterized by a mathematical model that includes terms of a conoid of rotation and a polynomial term.

243. (Previously Presented) The intraocular lens of claim 242 wherein said intraocular lens is structured so that, when said wavefront is represented as a series of Zernike polynomials, a Zernike Z11 term describing said wavefront reduced when said wavefront passes through said intraocular lens.

244. (Currently Amended) A diffractive multifocal intraocular lens comprising:

a first surface and a second surface, said second surface opposing said first surface, said first surface having a first shape and said second surface having a second shape, at least one of the surfaces being expressible as a linear combination of Zernike polynomial terms, an 11th term of a fourth order Zernike coefficient of the Zernike polynomial terms having a negative value;

wherein said first surface includes a diffractive pattern imposed on said first shape;

wherein said intraocular lens provides a base focus and an additional focus; and

wherein said intraocular lens is configured such that, when a wavefront expressible by a Zernike polynomial passes through said intraocular lens, said intraocular lens reduces a positive rotationally symmetric fourth order Zernike term of said Zernike polynomial of said wavefront.

245. (Canceled)

246. (Previously Presented) The intraocular lens of claim 244 wherein said intraocular lens is structured to reduce spherical aberration of a wavefront that passes through said intraocular lens.

247. (Canceled)

248. (Canceled)

249. (Previously Presented) The intraocular lens of claim 244 wherein said intraocular lens comprises at least one of a silicone, a hydrogel, and an acrylate.

250. (Previously Presented) The intraocular lens of claim 244 wherein said second surface has an aspheric component.

251. (Previously Presented) The intraocular lens of claim 244 wherein an add power for said additional focus is between 2 and 6 diopters.

252. (Previously Presented) The intraocular lens of claim 244 wherein an add power for said additional focus is 3 to 4 diopters.

253. (Previously Presented) The intraocular lens of claim 244 wherein a light distribution between said base focus and said additional focus is between 70%:30% to 30%:70%.

254. (Previously Presented) The intraocular lens of claim 244 wherein a light distribution between said base focus and said additional focus is 50%:50%.

255. (Previously Presented) The intraocular lens of claim 244 wherein said intraocular lens has a negative spherical aberration.

256. (Canceled)

257. (Previously Presented) The intraocular lens of claim 244 wherein said intraocular lens defines an optical axis, and at least one of said first shape and said second shape has a curvature at a periphery thereof that is less than a curvature at said optical axis.

258. (Previously Presented) The intraocular lens of claim 244 wherein said at least one of said first shape and said second shape is prolate.

259. (Previously Presented) The intraocular lens of claim 244 wherein said at least one of said first shape and said second shape is characterized by a mathematical model that includes at least one of (1) terms of a conoid of rotation and (2) terms of a conoid of rotation and at least one polynomial term.

260. (Previously Presented) The intraocular lens of claim 259 wherein said terms of said conoid of rotation include a conic constant that is less than zero.

261. (Previously Presented) The intraocular lens of claim 259 wherein said terms of said conoid of rotation include a conic constant that is less than minus one.

262. (Previously Presented) The intraocular lens of claim 244 wherein said at least one of said first shape and said second shape is a modified conoid surface.

263. (Previously Presented) The intraocular lens of claim 244 wherein said at least one of said first shape and said second shape is characterized by a mathematical model that includes terms of a conoid of rotation term and a polynomial term.

264. (Canceled)

265. (Previously Presented) The intraocular lens of claim 216 wherein said first shape has the aspheric component.

266. (Currently Amended) The intraocular lens of claim 216 wherein said aspheric component is configured to reduce, for an average cornea, and by a predetermined fraction, a rotationally symmetric fourth order Zernike term of said wavefront by a predetermined fraction, when said wavefront is expressed as a Zernike polynomial.

267. (Cancelled)

268. (Cancelled)

269. (Previously Presented) The intraocular lens of claim 244 wherein said first shape has an aspheric component.

270. (Currently Amended) The intraocular lens of claim 244 wherein at least one of said first surface and said second surface is configured to reduce, for an average cornea, and by a predetermined fraction, a the rotationally symmetric fourth order Zernike term of said wavefront by a predetermined fraction.

271. (Cancelled)

272. (Cancelled)

273. (New) The intraocular lens of claim 216 wherein intraocular lens deviates sufficiently from being a spherical lens to compensate for corneal aberrations.

274. (New) The intraocular lens of claim 216 wherein the positive spherical aberration is produced by an aspheric cornea having an aspheric corneal surface.

275. (New) The intraocular lens of claim 274 wherein the aspheric corneal surface is characterized by an equation having a conic constant of the corneal surface, the conic constant having a value between -1 and 0.

276. (New) The intraocular lens of claim 274 wherein the aspheric corneal surface is characterized by an equation having a conic constant of the corneal surface, the conic constant having a value of -0.26.

277. (New) The intraocular lens of claim 244 wherein the Zernike coefficient of the at least one surface is configured to balance a positive value of a corresponding coefficient term of a Zernike polynomial that characterizes the cornea.